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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/942,611	08/31/2001	Tsuyoshi Tanaka	520.40578X00	7496

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MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER

ALI, SYED J

ART UNIT	PAPER NUMBER
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2195

DATE MAILED: 07/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/942,611

Applicant(s)

TANAKA ET AL.

Examiner

Syed J. Ali

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

PD

DETAILED ACTION

1. This office action is in response to the amendment filed May 16, 2005. Claims 1-32 are presented for examination.
2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Information Disclosure Statement

3. Applicant has indicated that an Information Disclosure Statement ("IDS") originally filed August 31, 2001, has not been considered, and that a duplicate of Form PTO-1449 has been filed concurrently with the present amendment. There is no record of an IDS filed August 31, 2001 or with the present amendment.

Applicant is hereby advised to resubmit the IDS in a separate paper to the Official fax number, which has been changed as of July 15, 2005 to (571) 273-8300.

Claim Rejections - 35 USC § 112

4. **Claims 1-32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

5. The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors. For example, the

Art Unit: 2195

limitations of “lowing the load” (claim 25), “each virtual computers” (claim 27), are not grammatically correct. There are many instances of such grammatical errors in the claims.

Claim Rejections - 35 USC § 103

6. **Claims 1-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doing et al. (USPN 6,438,671) (hereinafter Doing) in view of Kauffman (USPN 6,633,916).**

7. As per claims 1-4, 6, 8, 10-16, and 18-20, Doing teaches the invention as claimed, including a virtual computer system, comprising:

a plurality of virtual computers operating on a physical computer having one or more CPUs (col. 5 lines 3-8), each of the plurality of virtual computers having an OS for measuring an occupation rate of said CPUs and/or a length of queue for execution of process (col. 10 lines 18-28); and

a hypervisor (Abstract; col. 5 lines 3-8; col. 11 lines 20-27), wherein said hypervisor comprises:

a reallocation section for dynamically changing allocation of physical resources to said plurality of virtual computers (col. 4 lines 40-55; col. 21 lines 36-44), and

a controller for searching physical resource allocation to said virtual computers and for demanding reallocation to said reallocation section (col. 4 lines 40-55; col. 21 lines 36-44).

Art Unit: 2195

8. Although Doing does not specifically address initiating reallocation based on load conditions monitored by a load monitor, it is well-known that hypervisors, also known as virtual machine monitors, perform repartitioning or reallocation in response to any number of conditions, including workload imbalance. Resources can be reassigned among logical partitions in response to practically any condition that would trigger resource reallocation in a computing system. This is demonstrated by Kauffman (USPN 6,633,916), which discusses the state of prior art with respect to resource allocation by hypervisors in virtual machines (col. 2 line 28 - col. 3 line 4). While Doing discloses how the resources may be repartitioned, the conditions that trigger the reallocation are not discussed at length.

Thus, it would have been obvious to one of ordinary skill in the art to reallocate resources in response to monitored load conditions, as Kauffman discusses some of the well-known factors that lead to reallocation of resources, including the claimed indicators of workload imbalance (col. 2 lines 51-59, "LPARs...can respond to changes in load dynamically", "if the logical...partitions have complementary peak loads, each partition can take over the entire physical...system as the workload shifts"; col. 2 line 66 - col. 3 line 2, "where the aggregate workload demand of all partitions is more than can be delivered by the physical system, LPAR weights can be used to define how much of the total CPU resources is given to each partition.")

Art Unit: 2195

9. As per claim 5, Kauffman teaches the invention as claimed, including a virtual computer system according to claim 2, wherein said OS can increase or decrease CPUs under operating state (col. 2 lines 51-59), and said hypervisor conducts process to increase or decrease the number of operating CPUs based on said measured information (col. 2 lines 39-42):

10. As per claim 7, Kauffman teaches the invention as claimed, including a virtual computer according to claim 1, wherein said controller generates a reallocation policy which increases a ratio of CPU allocation time offering to a virtual computer having high load from another virtual computer depending on CPU occupation rate of the other virtual computer (col. 2 line 28 - col. 3 line 4, "LPARs...can respond to changes in load dynamically...in several ways").

11. As per claim 9, Kauffman teaches the invention as claimed, including a virtual computer system according to claim 8, wherein the load conditions of said main memory device is obtained by frequency of paging and/or swap, and said reallocation section dynamically changes allocation amount of areas to said virtual computer of said main memory (col. 2 line 28 - col. 3 line 4, "LPARs...can respond to changes in load dynamically...in several ways").

Art Unit: 2195

12. As per claim 17, Kauffman teaches the invention as claimed, including a virtual computer system according to claim 13, wherein said load condition monitoring section issues transaction to the application program, and monitors load conditions of said virtual computers based on a time required to complete said transaction (col. 2 line 28 - col. 3 line 4, "LPARs...can respond to changes in load dynamically...in several ways").

13. As per claim 21, 25, and 29, Doing teaches the invention as claimed, including a virtual computer system, according to claims 1, 8, and 13, further comprising:

a storing section for storing contents of a plurality of actions for changing physical resources allocated to virtual computers judged as high load by said load monitor (col. 7 lines 48-56; col. 8 lines 17-26); and

a means for implementing said plurality of actions sequentially and for conducting physical resource reallocation according to contents of actions having effectiveness for lowering the load (col. 21 lines 36-44).

14. As per claims 22, 26, and 30, Kauffman teaches the invention as claimed, including a virtual computer system according to claims 1, 8, and 13, wherein said load monitor collects load of at least one of said virtual computers with a fixed interval, and detects periodic changes of collected load data (col. 2 line 28 - col. 3 line 4), and

15. Doing teaches the invention as claimed, wherein said controller determines said physical resource allocation based on said periodic change of the load, and demands periodical allocation of physical resources to said reallocation section (col. 21 lines 36-44).

16. As per claims 23, 27, and 31, Kauffman teaches the invention as claimed, including a virtual computer system according to claims 1, 8, and 13, wherein said controller decides a priority order of allocation of physical resources to each virtual computers in said reallocation section according to customers and agreement conditions (col. 2 line 28 - col. 3 line 4, "LPARs...can respond to changes in load dynamically...in several ways").

17. As per claims 24, 28, and 31, Kauffman teaches the invention as claimed, including a virtual computer system according to claims 23, 27, and 31, wherein said controller has a reference to judge different overload according to customers and agreement conditions for every virtual computers (col. 2 line 28 - col. 3 line 4, "LPARs...can respond to changes in load dynamically...in several ways").

Response to Arguments

18. Applicant's arguments with respect to claims 1-32 have been considered but are moot in view of the new grounds of rejection.

Conclusion

19. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J. Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T. An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2195

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
July 18, 2005



MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100